

WHAT IS CLAIMED IS:

- 1 1. A method of operating a wireless communications device, comprising:
2 maintaining a first set of queue information indicating for each of a plurality of different
3 transmission priority levels a number of data units to be transmitted; and
4 periodically generating a group of transmission requests over time as a function of said
5 maintained queue information, said group of transmission requests including:
6 a first transmission request specifying an absolute number of data units to be transmitted
7 for a first one of said plurality of different transmission priority levels.
- 1 2. The method of claim 1, wherein said group of transmission requests further includes:
2 a second transmission request.
- 1 3. The method of claim 2, wherein said first transmission request is located at a pre-selected
2 position within said group of requests, said step of generating said group of requests including:
3 incorporating in the first request, as said absolute number, a number of data units to be
4 transmitted corresponding to the highest transmission priority level having a non-zero number of
5 data units to be transmitted, as indicated by said set of queue information.
- 1 4. The method of claim 3, wherein generating said group of requests includes:
2 incorporating a second number of data units to be transmitted corresponding to another
3 transmission priority level, into said first transmission request.
- 1 5. The method of claim 2, further comprising:
2 maintaining a second set of queue information indicating for each of said plurality of
3 different transmission priority levels an estimate of a base station's estimate of the first set of
4 queue information maintained by said wireless communications device.
- 1 6. The method of claim 2, wherein said second transmission request includes a relative
2 value indicating a relative number of data units corresponding to one of said plurality of priority
3 levels to be transmitted.

- 1 7. The method of claim 6, wherein said relative value is relative to an estimate of a base
2 station estimate of a value in the first queue information maintained by said wireless
3 communications device.
- 1 8. The method of claim 5, wherein said second transmission request includes a relative
2 value indicating a relative number of data units corresponding to one of said plurality of priority
3 levels to be transmitted.
- 1 9. The method of claim 8, wherein said relative value is generated as a function of a
2 difference between the number of data units in the first and second queues correspond to said
3 one of said priority levels.
- 1 10. The method of claim 9,
2 wherein said absolute value is generated using a first quantization table; and
3 wherein said relative value is generated using a different quantization table including a
4 different number of quantization levels than said first table.
- 1 11. The method of claim 5, wherein said wireless terminal determines the priority level for
2 which said data unit information is to be included in at least one of said first and second requests
3 as a function of values included in both said first and second queues.
- 1 12. The method of claim 6, wherein said group of requests includes more requests including
2 relative values than requests including absolute numbers of data units to be transmitted for one
3 of said plurality of different transmission priority levels.
- 1 13. The method of claim 1, wherein the first and second requests include different numbers
2 of bits, the first request including at least twice the number of bits as the second request
3 message.
- 1 14. The method of claim 1, wherein each group of requests includes at least three requests,
2 the method further comprising:
3 transmitting each group of requests in a time period less than 98 milli-seconds in
4 duration.

1 15. The method of claim 1, further comprising:
2 transmitting said first transmission request to a base station at a first point in time;
3 discarding data corresponding to said first one of said plurality of different transmission
4 priority levels prior to receiving a signal indicating that said first transmission request was
5 granted;
6 updating said first set of queue information to reflect the discarding of data
7 corresponding to the first one of said plurality of different transmission priority levels; and
8 transmitting said second transmission request at a second point in time, said second point
9 in time following said updating of said first set of queue information to reflect the discarding of
10 data.

1 16. A wireless communications device, comprising:
2 a first set of queue information indicating for each of a plurality of different transmission
3 priority levels a number of data units to be transmitted; and
4 means for periodically generating a group of transmission requests over time as a
5 function of said maintained queue information, said group of transmission requests including:
6 i) a first transmission request specifying an absolute number of data units to be
7 transmitted for a first one of said plurality of different transmission priority levels; and
8 ii) a second transmission request.

1 17. The device of claim 16, wherein said first transmission request is located at a pre-
2 selected position within said group of requests, said means for generating a group of
3 transmission requests including:
4 means for incorporating in the first request, as said absolute number, the number of data
5 units to be transmitted corresponding to the highest transmission priority level having a non-zero
6 number of data units to be transmitted as indicated by said set of queue information.

1 18. The device of claim 16, wherein said means for generating said group of requests further
2 includes:
3 means for incorporating a second number of data units to be transmitted corresponding to
4 another transmission priority level into said first transmission request.

1 19. The device of claim 16, further comprising:

2 a second set of queue information indicating for each of said plurality of different
3 transmission priority levels an estimate of a base station's estimate of the first set of queue
4 information maintained by said wireless communications device.

1 20. The device of claim 19, further comprising:
2 memory for storing said first and second transmission requests prior to transmission, said
3 second transmission request including a relative value indicating a relative number of data units
4 corresponding to one of said plurality of priority levels to be transmitted.

1 21. The device of claim 20, wherein said relative value is relative to a number of data units
2 in said second set of queue information corresponding said one of said plurality of priority
3 levels.

1 22. The device of claim 19, further comprising:
2 memory for storing said second transmission request, said second transmission request
3 including a relative value indicating a relative number of data units corresponding to one of said
4 plurality of priority levels to be transmitted.

1 23. The device of claim 22, wherein said means for generating a group of requests generates
2 said relative value as a function of a difference between the number of data units in the first and
3 second queues correspond to said one of said priority levels.

1 24. The device of claim 23, further comprising
2 a first quantization table used to generate said absolute value; and
3 a second quantization table including a different number of quantization levels than said
4 first table, said second quantization table being used to generate said relative value.

1 25. The device of claim 19, wherein said wireless terminal includes means for determining
2 the priority level for which said data unit information is to be included in one of said first and
3 second requests as a function of the values included in both said first and second queues.

1 26. The device of claim 20, wherein said group of requests includes more requests including
2 relative values requests including absolute values.

1 27. The device of claim 16, wherein the first and second requests include different numbers
2 of bits, the first request including at least twice the number of bits as the second request
3 message.

1 28. A method of operating a base station to allocate uplink channel communications
2 resources in a multiple access system where multiple wireless terminals can request uplink
3 channel communication resources from said base station, the method comprising;
4 maintaining a set of queue information indicating, for each wireless terminal requesting
5 data units which have not yet been allocated as requested, the requested number of data units for
6 each priority level for which an unsatisfied data unit request was received;
7 monitoring to receive uplink channel resource requests from any one of said wireless
8 terminals;
9 in response to a received resource allocation request including at least one of an absolute
10 number of requested data units and a relative number of requested data units corresponding to
11 one of said transmission priority levels,
12 i) performing a queue information update operation; and
13 ii) allocating uplink channel resources as a function of the updated queue information.

1 29. The method of claim 28, wherein updating said queue information includes generating
2 updated requested numbers of data units for said plurality of priority levels as a function of L
3 most recent assignments made by said base station where L is a known value at the time said
4 request is received, L being a positive integer.

1 30. The method of claim 29, wherein said step of generating updated requested numbers of
2 data units as a function of the most recent L assignments includes accessing memory storing
3 assignment information as a vector including a mobile node identifier, a plurality of priority
4 levels and, for each priority level, an assigned number of data units.

1 31. The method of claim 29, wherein updating said queue information includes replacing a
2 number of data units, corresponding to one of said priority levels, in said set of queue
3 information with a requested number of data units corresponding to said one of said priority
4 levels, said requested number of data units being an absolute value communicated by said
5 received request.

1 32. The method of claim 31, further comprising:
2 setting the numbers of data units corresponding to priority levels which have a higher
3 priority than said one of said priority levels to zero.

1 33. The method of claim 29, wherein updating said queue information includes adding to the
2 number of data units corresponding to one of said priority levels in said set of queue information
3 with the requested number of data units specified in the received request.

1 34. The method of claim 29, wherein updating said queue information includes
2 subtracting at least some numbers of assigned data units in the L assignments to values included
3 in said set of queue information.

1 35. The method of claim 29, wherein updating said queue information includes
2 adding at least some numbers of assigned data units in the L assignments to values included in
3 said set of queue information.

1 36. A base station for allocating uplink channel communications resources in a multiple
2 access system where multiple wireless terminals can request uplink channel communication
3 resources from said base station, the base station comprising;
4 a set of queue information indicating, for each wireless terminal requesting data units
5 which have not yet been allocated as requested, the requested number of data units for each
6 priority level for which an unsatisfied data unit request was received;
7 a receiver for receiving uplink channel resource requests from any one of said wireless
8 terminals;
9 a module for performing a queue information update operation in response to a received
10 resource allocation request including at least one of an absolute number of requested data units
11 and a relative number of requested data units corresponding to one of said transmission priority
12 levels; and
13 means for allocating uplink channel resources as a function of the updated queue
14 information and said received resource allocation request.

1 37. The base station of claim 36, wherein said module for performing a queue information
2 update operation includes:

3 means for generating updated requested numbers of data units for said plurality of
4 priority levels as a function of L most recent assignments made by said base station where L is a
5 known value at the time said request is received.

1 38. The base station of claim 37, wherein said module for performing a queue update
2 operation further includes:

3 means for replacing a requested number of data units, corresponding to one of said
4 priority levels, in said set of queue information with a requested number of data units
5 corresponding to said one of said priority levels, said requested number of data units being an
6 absolute value communicated by said received request.

1 39. The base station of claim 38, wherein said module for performing a queue update
2 operation further includes:

3 means for setting requested numbers of data units corresponding to priority levels which
4 have a higher priority than said one of said priority levels to zero.

1 40. The base station of claim 37, wherein said module for performing a queue update
2 operation further includes:

3 means of adding a requested number of data units corresponding to one of said priority
4 levels in said set of queue information with a requested number of data units specified in the
5 received request.